Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

Claim 1 (currently amended): An image proeessing method, comprising:

an inputting step of inputting an image data which is obtained by imaging a subject for a predetermined period of time with a medical imaging apparatus and is arranged in time series;

an extracting along a time axis step of extracting pixels which satisfy a predetermined condition along a time axis from all the pixels arranged in time series for each pixel coordinate position with respect to each pixel in the image data; and

a constructing step of constructing a two-dimensional or three-dimensional image based on the pixels extracted along the time axis in the extracting along the time axis step, wherein

the extracting along the time axis step comprises: a first extracting along the time axis step of extracting a pixel having a first characteristic from all the pixels arranged in time series for each pixel coordinate position along the time axis; and a second extracting along the time axis step of extracting a pixel having a second characteristic from all the pixels arranged in time series along the time axis, and

the constructing step comprises: a first constructing step of constructing a first image based on the pixel having the first characteristic; and a second constructing step of constructing a second image based on the pixel having the second characteristic, and

the image processing method further comprises: a difference operation step of performing a difference operation on the first image and the second image; and a difference image producing step of producing a difference image based on the result of the difference operation.

Claim 2 (original): The image processing method according to claim 1, further comprising:

an image reconstructing step of reconstructing a two-dimensional or three-dimensional image which corresponds to a two-dimensional or three-dimensional range of the subject based on the image data; and

a region of interest setting step of setting at least one region of interest for the two-dimensional or three-dimensional image,

wherein the extracting along the time axis step comprises extracting pixels which satisfy a predetermined condition along the time axis from all the pixels arranged in time series for each pixel coordinate position for each pixel constituting the region of interest.

Claim 3 (previously presented): The image processing method according to claim 1, wherein the predetermined condition is to extract a pixel having a maximum pixel value along the time axis from all the pixels arranged in time series at each pixel coordinate position.

Claim 4 (previously presented): The image processing method according to claim 1, wherein the predetermined condition is to extract a pixel having an arbitrary pixel value among pixel values corresponding to each pixel arranged in time series at each pixel coordinate position along the time axis.

Claim 5 (previously presented): The image processing method according to claim 1, wherein the extracting along the time axis step comprises: sequentially comparing a pixel value

at a first time in the predetermined period of time with a pixel value at a second time in the predetermined period of time for each pixel coordinate position with respect to each pixel in the image data along the time series; and extracting pixels which satisfy a predetermined condition along the time axis.

Claim 6 (previously presented): The image processing method according to claim 1, wherein the extracting along the time axis step comprises: a filtering process along the time axis to perform a predetermined filtering process on all the pixels arranged in time series for each pixel coordinate position along the time axis and obtain pixels representing each pixel coordinate position.

Claim 7 (canceled).

Claim 8 (currently amended): ~~The image processing method according to claim 7~~ An image processing method, comprising:

an inputting step of inputting an image data which is obtained by imaging a subject for a predetermined period of time with a medical imaging apparatus and is arranged in time series;

an extracting along a time axis step of extracting pixels which satisfy a predetermined condition along a time axis from all the pixels arranged in time series for each pixel coordinate position with respect to each pixel in the image data; and

a constructing step of constructing a two-dimensional or three-dimensional image based on the pixels extracted along the time axis in the extracting along the time axis step, wherein

the extracting along the time axis step comprises: a first extracting along the time axis

step of extracting a pixel having a first characteristic from all the pixels arranged in time series for each pixel coordinate position along the time axis; and a second extracting along the time axis step of extracting a pixel having a second characteristic from all the pixels arranged in time series along the time axis, and

the constructing step comprises: a first constructing step of constructing a first image based on the pixel having the first characteristic; and a second constructing step of constructing a second image based on the pixel having the second characteristic, and

the image processing method further comprises: a difference operation step of performing a differencc opcration on the first image and the second image; and a difference image producing step of producing a difference image based on the result of the difference operation,

wherein the pixel having the first characteristic is the maximum pixel value in the pixel values of all thc pixcls arranged in time series at each pixel coordinate position, and the pixel having the second characteristic is the minimum pixel value in the pixel values of all the pixels arranged in time series at each pixel coordinate position.

Claim 9 (original): An image processing method, comprising:

an inputting step of inputting an image data obtained by imaging a subject into which a contrast medium is injected for a predetermined period of time with a medical imaging apparatus and arranged in time series;

an image reconstructing step of reconstructing three-dimensional images arranged in time series based on the image data;

an extracting along the time axis step of extracting a maximum value pixel which has a clearest contrasted image by the contrast medium and a minimum value pixel which has little or

no residual contrast medium therein from all the pixels arranged in time series for each pixel coordinate position along the time axis with respect to each pixel constituting the three-dimensional images arranged in time series;

a constructing step of constructing a two-dimensional or three-dimensional image which has a clearest contrasted image by the contrast medium based on the maximum value pixel and a two-dimensional or three-dimensional image with no or little residual contrast medium therein based on the minimum value pixel;

a difference operation step of performing a difference operation on the two-dimensional or three-dimensional image which has a clearest contrasted image by the contrast medium and the two-dimensional or three-dimensional image with no or little residual contrast medium therein; and

a difference image producing step of producing a difference image based on the result of the difference operation.

Claims 10-14 (canceled).

Claim 15 (original): An image processing device, comprising:

an input means which inputs an image data obtained by imaging a subject into which a contrast medium is injected for a predetermined period of time with a medical imaging apparatus and arranged in time series;

an image reconstructing means reconstructs three-dimensional images arranged in time series based on the image data;

an extracting along the time axis means which extracts a maximum value pixel which has

a clearest contrasted image by the contrast medium and a minimum value pixel which has little or no residual contrast medium therein from all the pixels arranged in time series for each pixel coordinate position along the time axis with respect to each pixel constituting the three-dimensional images arranged in time series;

a construction means which constructs a two-dimensional or three-dimensional image which has a clearest contrasted image by the contrast medium based on the maximum value pixel and a two-dimensional or three-dimensional image with no or little residual contrast medium therein based on the minimum value pixel;

a difference operation means which performs a difference operation on the two-dimensional or three-dimensional image which has a clearest contrasted image by the contrast medium and the two-dimensional or three-dimensional image with no or little residual contrast medium therein; and

a difference image producing means which produces a difference image based on the result of the difference operation.

Claims 16-18 (canceled).

Claim 19 (original): A computer aided detection, comprising:

a medical imaging apparatus which obtains an image data arranged in time series by imaging a subject for a predetermined period of time;

an operation device which constructs a two-dimensional or three-dimensional image based on the image data; and

a displaying device which displays an image produced by the operation device, wherein

the operation device comprises:

an input means which inputs the image data obtained by imaging a subject into which a contrast medium is injected for a predetermined period of time with a medical imaging apparatus and arranged in time series;

an image reeonstructing means which reconstruets three-dimensional images arranged in time series based on the image data;

an extracting along the time axis means which extracts a maximum value pixel which has a clearest contrasted image by the contrast medium and a minimum value pixel which has little or no residual contrast medium therein from all the pixels arranged in time series for each pixel coordinate position along the time axis with respect to each pixel constituting the three-dimensional images arranged in time series;

a constructing means which constructs a two-dimensional or three-dimensional image which has a clearest contrasted image by the contrast medium based on the maximum value pixel and a two-dimensional or three-dimensional image with no or little residual contrast medium therein based on the minimum value pixel;

a difference operation means which performs a difference operation on the two-dimensional or three-dimensional image which has a clearest contrasted image by the contrast medium and the two-dimensional or three-dimensional image with no or little residual contrast medium therein; and

a difference image producing means which produces a difference image based on the result of the difference operation, and wherein

the displaying device displays the difference image produced by the difference image producing means.

Claims 20-27 (canceled).

Claim 28 (new): The image processing method according to claim 8, further comprising:

an image reconstructing step of reconstructing a two-dimensional or three-dimensional image which corresponds to a two-dimensional or three-dimensional range of the subject based on the image data; and

a region of interest setting step of setting at least one region of interest for the two-dimensional or three-dimensional image,

wherein the extracting along the time axis step comprises extracting pixels which satisfy a predetermined condition along the time axis from all the pixels arranged in time series for each pixel coordinate position for each pixel constituting the region of interest.

Claim 29 (new): The image processing method according to claim 8, wherein the predetermined condition is to extract a pixel having a maximum pixel value along the time axis from all the pixels arranged in time series at each pixel coordinate position.

Claim 30 (new): The image processing method according to claim 8, wherein the predetermined condition is to extract a pixel having an arbitrary pixel value among pixel values corresponding to each pixel arranged in time series at each pixel coordinate position along the time axis.

Claim 31 (new): The image processing method according to claim 8, wherein the

extracting along the time axis step comprises: sequentially comparing a pixel value at a first time in the predetermined period of time with a pixel value at a second time in the predetermined period of time for each pixel coordinate position with respect to each pixel in the image data along the time series; and extracting pixels which satisfy a predetermined condition along the time axis.

Claim 32 (new): The image processing method according to claim 8, wherein the extracting along the time axis step comprises: a filtering process along the time axis to perform a predetermined filtering process on all the pixels arranged in time series for each pixel coordinate position along the time axis and obtain pixels representing each pixel coordinate position.